WHAT IS CLAIMED IS:

1. A method of filling a metal in fine trenches in a surface of a substrate, comprising:

forming a metal film on a surface of a substrate having fine trenches in the surface by electroplating, wherein an electromagnetic field between an anode and the surface is adjusted by a virtual anode during the electroplating;

polishing the surface and removing a portion of the plated metal film by pressing the surface of the substrate to a polishing surface, wherein the pressures pressing the substrate to the polishing surface at a central portion and a peripheral portion of the substrate are adjusted independently.

2. The method according to claim 1, wherein the electromagnetic field is adjusted by the virtual anode so that the difference of thicknesses of the plated metal film between the central portion and the peripheral portion of the substrate are reduced.

3. The method according to claim 2, wherein the pressures pressing the substrate to the polishing surface at the central portion and the peripheral portion are adjusted independently to eliminate the reduced difference of the thicknesses of the plated metal film between the central portion and the peripheral portion of the substrate.

4. The method according to claim 1, further comprising annealing the electroplated substrate prior to polishing.

5. The method according to claim 4, wherein the forming the metal film and the annealing are performed in an electroplating unit and an annealing unit respectively placed in an electroplating apparatus.

6. The method according to claim 1, further comprising cap-plating the polished metal film to form a protective layer on the polished metal film.

7. The method according to claim 6, wherein the step of cap-plating is performed by electroless-plating.

8. The method according to claim 6, wherein the polishing and the cap-plating is performed in a polishing unit and in an electroless-plating unit placed in a polishing apparatus.

9. The method according to claim 1, further comprising measuring the thickness of the plated metal film on the substrate prior to the polishing.

10. The method according to claim 9, wherein the pressures to press the substrate against the polishing surface at the polishing apparatus are adjusted based on output of the measuring step.

11. The method according to claim 1, wherein the metal comprises copper.

12. The method according to claim 1, further comprising:

measuring an electric resistance between a seed layer on the surface of the substrate and a cathode prior to the forming the metal film.